

OBITUARY NOTICE OF FELLOW DECEASED.

HENRY MANGLES DENHAM, son of the late Henry Denham, Esq., of Sherborne, was born on the 28th of August, 1800.

He commenced his career in the Royal Navy at a very early age, and continued an almost uninterrupted course of service afloat in the surveying branch of the profession for the long period of fifty years.

He was one of the most able and eminent of our nautical surveyors, and was considered a high authority on all questions relating to hydrographical engineering; he was intimately connected with the improvement of our great commercial ports, upon which his counsel and advice were frequently sought, almost to the close of his life.

During his early service, between the years 1810 and 1827, he was employed under that distinguished surveying officer, Captain Martin White, on the surveys of the Channel Islands, and in the English and Irish Channels. In the latter year he was appointed to the command of the "Linnet," of ten guns, and, during the next seven years, he conducted the surveys of the Bristol Channel and of the ports of Liverpool and Milford.

He was promoted to the rank of Commander in 1835; and his next service in command of the "Lucifer" was on the surveys of the coast of Lancashire and Cumberland. In 1845 he was appointed to the command of the "Avon," and was sent to the West Coast of Africa on special surveying duties, which he conducted with so much ability, under very unfavourable circumstances, that he was rewarded with post rank in the following year—1846.

He then returned to England, and was again employed on hydrographical duties connected with the home coasts.

Early in the year 1852 Captain Denham was appointed to the command of an expedition, consisting of H.M. ships "Herald" and "Torch," for exploration and survey in the Western Pacific, where he was actively employed until the close of the year 1860.

During this protracted voyage the "Herald" and her consort added greatly to the hydrographical knowledge of this extensive region. Various surveys were made on both the eastern and western coasts of Australia, but the region of Captain Denham's special exploration was the Coral Sea, where he thoroughly examined and defined the route outside the Great Barrier Reefs, by Torres Strait, to the Dutch possessions in the Java Sea, Singapore, and India; likewise among the various groups of islands eastward and northward of Australia, where the salient points of New Caledonia, the New

Hebrides, Fiji and Tonga groups, with those of the Solomon and Louisiade Archipelagos, were accurately determined, and numerous doubtful dangers, long the cause of perplexity and anxiety to the navigator, were either correctly placed or proved to have no existence.

These examinations, and the improved conditions of the charts which resulted from them, much facilitated the intercourse between our great Australasian colonies, the islands of the Western Pacific, and the coasts of China and Japan.

During this voyage a considerable portion of the Fiji group was also surveyed in detail, but the "Herald's" long absence from England caused the completion of this work to be left to other hands.

In 1861 the "Herald" returned to England by Torres Straits and the Cape of Good Hope, arriving home in the month of May, and this memorable voyage terminated Captain Denham's active service afloat.

During the short intervals of active service under the Admiralty, Captain Denham executed several commissions connected with the mercantile steam marine for the Lords Committee of the Privy Council for Trade, and also with reference to harbour improvements at Liverpool, Swansea, and Bideford.

He received votes of thanks from various National and Local Boards, and in 1834 was presented with the freedom of the borough of Liverpool, and elected a member of the Literary and Philosophical Society of that city.

In 1839 he was elected a Fellow of the Royal Society, and, in 1841, a brother of the Corporation of Trinity House, and a corresponding member of the United States National Institute for the Promotion of Science.

Sir Henry Denham was knighted for his long and important services in the "Herald" on the Pacific Station, and especially for the assistance he rendered by his counsel and otherwise to the New South Wales Government during the Russian War of 1854-55.

He was promoted to the rank of Rear-Admiral in March, 1864, of Vice-Admiral in January, 1870, and Admiral in August, 1877.

He died at his residence, Carlton Gardens, on July 3rd, 1887.

G. H. R.

Mr. JOHN ARTHUR PHILLIPS, F.G.S., F.C.S., and M.I.C.E., who died at his home in London through a sudden attack of illness on the 5th of January, 1887, was one of those devotees of scientific inquiry who deserve to have a longer portion of life blest with that leisure which is needed for research.

He was born in the neighbourhood of Polgooth Mine, near St. Austell, Cornwall, and appears to have taken as a boy a hereditary interest in mining and metallurgical matters, for his grandfather was the manager of that noted old tin mine, and was quoted as "its very intelligent director," by Mr. J. Hawkins, F.R.S., and as his chief informant in 1791, on the phenomena of that remarkable locality which was described by Mr. Hawkins in the first volume of the 'Transactions of the Royal Geological Society of Cornwall' in 1818.

Mr. Phillips' attention was drawn in early youth to observations and experiments connected with electricity and the deposition of metallic copper. We may trace this in part to the influence of the Polytechnic Society of Cornwall and its useful annual exhibitions at Falmouth, as well as to the example and studies of the late Robert Were Fox, F.R.S., one of its founders. Young Phillips soon becoming desirous of a more thorough grounding in the metallurgical sciences, entered as a student at the École des Mines, passed its curriculum with credit, and for a short time was intrusted with the charge of a coal mine in the South of France.

On returning to England Mr. Phillips was employed in taking a practical part in the evaporation experiments on steam coals carried out with a Cornish boiler at the Civil Engineers College at Putney, for the Admiralty, the results of which were embodied in the well-known "Report." This work was followed up by various papers on chemical and metallurgical subjects, among which one of the most generally interesting was a "Chemical Examination of the Metals known to the Ancients" ('Journal of the Chemical Society,' 1852, and 'Liebig's Annalen,' vol. 81).

For many years past the rich silver-lead lodes of Pontgibaud in the Auvergne have been worked by a partly English Company, and Mr. Phillips was engaged for a considerable time, between 1855 and 1860, on behalf of the Messrs. Taylor of London, the managers, in experimenting and erecting furnaces for the treatment of those ores. He also for a few years acted as a consulting mining engineer, taking the opportunity of visiting and describing the singular gold-bearing deposits of Nova Scotia, and the more important gold fields of California, his notes on which were published in the 'Proceedings of the Royal Society,' 1868.

But it was not until his metallurgical aptitude was proved by success as a manager that Mr. Phillips obtained the leisure to take up independent studies. The profitable results which attended the co-

operation of Mr. Claudet and himself in the conduct of a work at Widnes, in which copper, silver, and gold were extracted from "burnt" Spanish pyrites, placed him in a more favourable position.

He became a Fellow of the Geological Society, and in the 'Quarterly Journal' of that Society, in the 'Philosophical Magazine,' as also in our own 'Proceedings' and elsewhere, he brought out a long series of papers descriptive of results of chemical analysis and of microscopic work as bearing on mining and geological subjects. Among these some of the more notable were those on the phonolite of the Wolf Rock, on the salt spring at Wheal Seton Copper Mine, on the "greenstones" of Cornwall, in which he confirmed the views of Mr. Allport as to the great extent to which rocks, originally augitic, have been converted into varieties of a hornblende character. This he followed up by observations on chemical and mineralogical changes which have taken place in the igneous rocks of North Wales; and in a generally interesting paper in 1875 he showed reasons for calling in question the startling generalisation of Mr. Sorby as to the depth and pressure under which the granitic rocks had been formed.

Numerous observations had before been made on the subject of the dark enclosures—whether rounded or angular—which so often occur in granite; but Mr. Phillips seems to have been the first to apply (1879) a series of analyses and microscopical investigations to the question, although only confirming, after all, the old opinion that some of them are concretionary, others only fragments.

Meanwhile, at various intervals several larger works had issued from his pen—an elementary, and then a fuller Manual of Metallurgy, a treatise on the Mining and Metallurgy of Gold and Silver, a very full compilation from well-selected sources on Ore Deposits; and at the very last he was occupied in bringing out a new edition of his Metallurgy.

Mr. Phillips, on coming from Lancashire to reside in London, added greatly to his circle of friends by his generous and outspoken character, and his good common sense and special knowledge will be seriously missed at the council tables of Societies at which he was a frequent attendant.

W. W. S.

JOSEPH BAXENDELL was born in Manchester in 1815, and died at Southport on October 7th, 1887. Having to make his way in the world he was sent to sea at an early age. It is believed that the circumstances of his profession led him to recognise the immense importance of the two great branches of observational science astronomy and meteorology, and to interest himself in their cultivation.

With this object in view he was assiduous in supplementing the

deficiencies of a limited education, and ultimately acquired a knowledge of mathematics which was of much service to him in his scientific investigations.

Mr. Baxendell was what this training made him. He became a thoughtful and retiring student of nature rather than one who cared to take a prominent place in general scientific society. But he was much esteemed by those whose tastes were similar to his own, and a meeting of such students usually took place once a fortnight during the winter months at the rooms of the Manchester Literary and Philosophical Society. At first Mr. Baxendell was a regular attendant at these meetings, and ultimately he was chosen to be Secretary of the Society and Editor of its publications. The duties of these offices were discharged by Mr. Baxendell in a very intelligent and conscientious manner.

In astronomy Mr. Baxendell contributed observations of various kinds. Of these perhaps the most important are embodied in his Catalogue of Variable Stars, a work which is highly esteemed by all astronomers.

In meteorology his contributions are of conspicuous importance, and in one branch of this science he may claim to be the pioneer.

In 1871, after having discussed eleven years' observations of the Radcliffe Observatory, Oxford, he came to the conclusion that the forces which produce the movements of the earth's atmosphere are most energetic in those years when there are numerous spots on the surface of the sun. This conclusion was, like that of many similar pioneers, derived from perhaps a somewhat limited series of observations, but the sagacity of Mr. Baxendell is justified by the fact that many other men of science have since followed in his footsteps.

Mr. Baxendell was likewise an independent discoverer of the fact that the faculæ which accompany sun-spots are thrown more behind them than before—the word *behind* having reference to the direction of rotation of the sun upon its axis.

Again he entertained the opinion, which has since spread, that the behaviour of sun-spots is connected in an intimate manner with that of meteoric matter round the sun.

Mr. Baxendell foretold the long drought of 1868, and persuaded the city of Manchester to take precautionary measures which had the effect of mitigating the inconvenience arising from want of water.

He was a Fellow of the Royal Astronomical Society, a corresponding member of the Royal Society of Königsberg, of the Scientific and Literary Academy of Palermo, and of the National Observatories of France, Germany, and Italy.

He held for many years the office of Astronomer to the Manchester

Corporation, and was residing at the Observatory, Southport, at the time of his death.

B. S.

SIR GEORGE BURROWS, who died December 12th, 1887, was born in 1801 in Bloomsbury Square. His father, Dr. George Man Burrows, a member of a family of Kentish yeomen, who had lived for at least two centuries at Chalk, near Gravesend, was at that time a general practitioner, and one of the most energetic. His early education was at a school of good renown at Ealing, kept by Dr. Nicholas; and among his teachers was Professor Huxley's father, to whose lessons he ascribed the love of mathematics which led to much of his success in later life. In 1819 and 1820, being destined for the medical profession, he attended Mr. Abernethy's lectures and dissected at St. Bartholomew's Hospital, and attended the lectures of Brande and Faraday at the Royal Institution. In 1821 his father determined to send him to Edinburgh, that he might there take his doctor's degree, and the day for his leaving London was fixed; but, on the urgent advice of Dr. Latham, who pointed out the far greater value of an English degree to one who was to practise in London, the plan was changed, and he went to Cambridge and entered at Caius College.

There he worked hard, did well in the annual college examinations, was active in athletics, a good rower and cricketer, but in social life was deemed quiet and reserved. In 1825 he took his B.A. degree, passing as tenth wrangler, and was soon after elected a Fellow of his College. During his undergraduate time he had been appointed to a Tancred Studentship, which involved the necessity of his taking the M.B. within the year after the B.A.; but he obtained some respite from this rule, took pupils, was a junior mathematical lecturer, studied what he could of medicine with the University professors, and passed the M.B. examination at some time in 1826. Soon after this he returned to St. Bartholomew's, was for twelve months one of Lawrence's dressers, and was a constant worker with Latham and Watson. Thus he went on till, having a good opportunity of travelling, he visited and studied at the Universities of Paris and Pavia and some of those in Germany. In 1829 he obtained at Cambridge a licence to practise, and was admitted an inceptor candidate at the College of Physicians. In 1831 he took his M.D., and was appointed with Dr. Roupell to the Lecturership on Forensic Medicine, then first instituted at St. Bartholomew's. In 1832 he was admitted a Fellow of the College of Physicians, and was put in charge of wards prepared for cholera patients in the epidemic of that year, the first time of its occurrence in England. In 1834 he was appointed the first Assistant-Physician, and took charge of medical out-patients, who were then, for the first time, dealt with as a separate class.

From this time onwards Sir George Burrows's career was one of constantly increasing success and professional distinction. It may be indicated by the offices to which he was appointed.

At the College of Physicians he was Gulstonian Lecturer in 1834; Croonian in 1835 and 1836; Lumleian in 1843 and 1844; Censor in 1839-40-43 and -46; Councillor for five periods of three years between 1838 and 1870; President from 1871 to 1875. In the General Medical Council he represented the College, and was one of the Treasurers from 1860 to 1863, and was President from 1864 to 1869.

In the Hospital he became in 1834 sole Lecturer on Forensic Medicine, in 1836 joint Lecturer on Medicine with Dr. Latham, in 1841 sole Lecturer and full Physician,—appointments which he held till 1863, when, on his retirement, he was elected Consulting Physician.

In 1870 he was appointed Physician-Extraordinary to the Queen; in 1873, Physician-in-Ordinary. In 1874 he was made a Baronet.

He was President of the Medico-Chirurgical Society in 1869-71; President of the British Medical Association in 1862; was elected a Fellow of the Royal Society in 1847, and Honorary LL.D. of Cambridge and D.C.L. of Oxford, a Member of the Senate of the University of London, and an Honorary Fellow of Caius College, Cambridge. He was a very active member, as his father had been, of the Society for the Relief of Widows and Orphans of Medical Men, and was for many years its President, as he was also of the British Medical Benevolent Fund.

This brief and swift recital of the appointments which Sir George Burrows filled may tell the general character of his professional life, and may be sufficient evidence of the esteem with which he was always regarded, and of the assurance that was felt that, whatever duties were assigned to him, he would do them well. All the high offices, all the honours conferred on him, seemed to come quite naturally and of course; he never asked for one, or did anything on purpose to obtain one; his having them excited neither jealousy nor surprise; and herein may be at once the explanation and the chief lesson of his life. He had excellent mental power. He showed it in his University career, and always afterwards; but that which was yet more admirable and characteristic was his steadfast, resolute use of his power straight to the work he had to do. More enthusiasm or more enterprise might have made him a more impressive or more popular teacher, might have made him more keen in research, more successful in acquiring new knowledge; but they might not have added to the general utility or the good influence of the long life which he spent in learning and teaching what seemed directly useful, in treating disease in the methods generally regarded as the best, and

in discussing all manner of questions relating to his profession in senates, councils, and committees.

Sir George Burrows was not a frequent writer on medical subjects. The only book he wrote was 'On the Disorders of the Cerebral Circulation,' 8vo., 1846. The substance of it had been given in the Lumleian Lectures at the College of Physicians in 1843 and 1844, and its chief value was in the evidence which it gave of the error of the belief, then generally held, that the cranium being a complete case of bone, completely filled by the brain and its membranes, and excluding from them all atmospheric pressure, the quantity of blood circulating in the brain cannot be materially increased or diminished by posture, bleeding, changes in the heart or breathing, or by any such means. The belief thus held was not only general, but was influential in the treatment of disease, leading some to hold that, so long as the skull was entire, no abstraction of blood, by any manner of bleeding, could have any effect on the blood-vessels of the brain, so as to lessen the absolute quantity of blood contained within them.

In opposition to this, Sir George Burrows showed, in careful experiments, testing those of Dr. Kellie on which chiefly the belief had rested, that the quantity of blood in the brain is materially altered by bleeding largely, and by posture and by suffocation; and that, admitting that the contents of the cranium must be always nearly the same, the variations in the blood may be balanced by those of the cerebro-spinal fluid.

As one reads this book one cannot but regret that he did not give himself more frequently to original research, for it is clear, critical, and definite, and it greatly helped to the correction of serious errors. But he was not fond of research; he preferred the daily business of practical life, and in it the use of the best knowledge he could gain from others' and his own attentive observation. The only other essays that he published were two papers in the 'Medico-Chirurgical Transactions,' one "A Case of Extensive Carcinoma in the Lungs," in vol. 27, the other on "Tubercular Pericarditis," in vol. 30, and the articles on measles, scarlet fever, and hæmorrhage in Tweedie's 'Library of Medicine.' Besides these he published some clinical lectures in the 'Medical Gazette;' and his first lecture on Forensic Medicine, which was also separately printed, is in the 'London Medical and Surgical Journal' for February 4th, 1832.

From all this I think it may justly be said that that which most marked Sir George Burrows's mental character, and contributed most to his professional success and to his influence and utility, was that, having a strong will and a strong, clear intellect, he applied them steadfastly to the plain daily duties of his life.

J. P.

ASTLEY COOPER KEY was the second son of Mr. Charles Aston Key, Surgeon-in-Ordinary to H.R.H. the late Prince Consort, and was born in the year 1821; he was educated at the Royal Naval College at Portsmouth, and from his boyhood he manifested a scientific bent of mind, which he cultivated and followed up in after life, so far as the duties of a most active and unremitting professional career afforded him the leisure to do so.

At the Naval College he gained the prize which carried with it a Lieutenant's commission, and he was consequently promoted to that rank as soon as he became eligible in point of age.

In 1843 he was appointed to the "Gorgon," Captain, afterwards Sir Charles, Hotham, and served in her on the South-east Coast of America; he was the junior Lieutenant of this ship in 1844 when, during a severe *pumpero*, she was driven from her anchors at Monte Video, and cast upon the beach; when the waters had subsided, which during this storm had risen 20 feet above the usual sea-level, the "Gorgon" was left literally on the dry land, from which very few, save her gifted Captain—who never doubted but that she must float again—believed that she would ever be moved; Mr. Key was among those few, and by his zeal and untiring exertions added in no small degree to the successful result. After many months of persevering efforts, under great difficulties and undiscouraged by frequent failure, the "Gorgon," by the united exertions of the English squadron in these waters, was again, uninjured, upon her proper element.

The writer of this notice was present, and well remembers the jokes and jeers of the foreign ships of war at her expense; the French Admiral remarking "that no one but a pig-headed Englishman would have persevered in such a hopeless task." He was the first, however, in his flag-ship to give the "Gorgon" three hearty cheers as she steamed round the squadron after her remarkable release.

Mr. Key wrote a narrative of the means employed in this most successful operation entitled, "The Recovery of the 'Gorgon,'" which added much to his professional reputation. In the following year (1845) the "Gorgon" took part in the combined attack by the English and French squadrons on the forts and forces of General Rosas, President of Buenos Ayres, at Obligado, in the Parana.

Captain Hotham, who commanded the English squadron, gave Mr. Key the command of an armed brig (the "Fanny") on this expedition, and in her he was present at the capture of the forts and during the subsequent operations which were undertaken with the view of opening the upper waters of the River Plate, and establishing commercial intercourse with Paraguay. These operations were continued until the close of the year 1846; and for his share in them

Mr. Key was promoted to the rank of Commander on the day of the action at Obligado—viz., the 18th of November, 1845.

Commander Key's next service was in command of the "Bull Dog," from 1847 to 1850, with the Mediterranean Fleet, under the late Admiral Sir William Parker, Bart. During the Sicilian Revolution of 1848 he was despatched for the protection of British subjects at Palermo, where by his energy and tact the Neapolitan troops were prevented from attacking the English quarter of the city; he was afterwards sent on a delicate mission to Civita Vecchia, and placed his ship at the disposal of the Pope should it have become necessary for him to embark from his dominions—Rome being in a very disturbed state. His Holiness, however, from various causes decided to escape by land to Gaeta, which he did in disguise.

Commander Key's services were so highly appreciated by the Commander-in-Chief on these occasions that he was especially recommended, and was promoted to the rank of Captain in 1850.

Captain Key next served in command of the "Amphion" during the Baltic Campaign of 1854, when he took part in the capture of the forts of Bomarsund, and other operations.

In 1855 he was appointed to the command of the "Sans Pareil" screw line-of-battle-ship, and was one of the Captains selected to command a flotilla of gun- and mortar-boats then preparing for the attack on Cronstadt, in the summer of that year; in the meantime, however, peace was concluded with Russia, when for his services during the war he was nominated a C.B.

On the breaking out of the Indian Mutiny, in 1857, he was sent in the "Sans Pareil" with a squadron of gunboats to Calcutta, and for his services there received the thanks of the Indian Government.

In 1858 he was ordered to China, and commanded a battalion of seamen at the capture of Canton. On the signing of the Treaty of Peace at Tientsin in June, 1858, Captain Key returned to England and served as the naval member on the Royal Commission which was appointed to consider the condition of our coast defences.

In 1860 he was appointed to the command of the Steam Reserve at Devonport, and after three years' service in that capacity he was transferred to the command of the "Excellent," the gunnery ship at Portsmouth, and was also Superintendent of the Royal Naval College at that port, where he served until 1865.

About this time, the great change in the size and power of naval guns, brought about by the introduction of armour-plated ships, necessitated the creation of a new department at the Admiralty, and Captain Key was appointed Director-General of this new Naval Ordnance Department, which he held as Captain and Rear-Admiral until 1869, having been promoted to flag rank in 1866.

In the latter part of 1869 he was appointed Admiral Superintendent

of Portsmouth Dockyard, but was shortly transferred to a similar position at Malta, when he became second in command of the Mediterranean fleet.

Soon after vacating this position, he was at the end of 1872 appointed President of the newly-established Naval College at Greenwich for the higher education and study of naval officers of all ranks. In 1873 he was promoted to the rank of Vice-Admiral, and in January, 1876, was appointed Commander-in-Chief on the North American and West Indian Stations. In 1878 he became Admiral, and received the appointment of First and Principal Naval Aide-de-Camp to the Queen.

In the year 1879 he went to the Admiralty as Principal Naval Lord, where he served under two administrations until 1885. During Lord Northbrook's absence on his mission to Egypt in 1884, Sir Cooper Key was sworn of the Privy Council, and conducted the administration of the Admiralty.

In 1866 he came under the Age Retirement Scheme, and was placed on the Retired List of Admirals. He had been nominated a K.C.B. in 1873, and was raised to the dignity of a G.C.B. in 1882. The University of Oxford had, in 1880, conferred upon him the honorary degree of D.C.L.

There have been few naval officers who have enjoyed so long and uninterrupted a career, or who have held positions of so important and responsible a character as Sir Cooper Key. He was always a most successful and popular officer, and during his whole course of service had displayed qualities and abilities of a high order, whether as a commander or an administrator; he was an earnest and generous supporter of many benevolent institutions, especially of those connected with the moral and religious training of seamen.

He died at his residence, Laggan House, Maidenhead, on the 3rd of March, 1888.

G. H. R.

VICE-ADMIRAL THOMAS A. B. SPRATT, C.B., the eldest son of the late Commander James Spratt, who served with much distinction on board H.M.S. "Defiance" at the battle of Trafalgar, was born in 1811, and entered the navy in 1827. As midshipman he joined the surveying branch of the naval service on board H.M.S. "Mastiff" in the Mediterranean, on which station he served all but continuously until 1863.

In 1847 he was appointed as a lieutenant to the command of the surveying vessel "Volage," and in the following year succeeded as commander to the command of the "Spitfire," the principal surveying ship of the station.

Employed mainly in the Archipelago, Commander Spratt worked

steadily at charting those intricate seas, whilst his archæological and geological knowledge enabled him to make and publish many scientific observations on the places visited. In 1847 he published with Professor E. Forbes a work on 'Travels in Lycia.'

During the Crimean war the "Spitfire" was attached to the fleet in the Black Sea, and Commander Spratt's services were in constant requisition. Besides surveys of all the places required for the anchorage or operations of the fleet, some of them made under the enemy's fire, he planned the attacks on Kertch and Kinburn, and led the combined fleet to their position before the latter place. He repeatedly received the acknowledgements of the Commander-in-Chief, Admiral Sir E. Lyons, for his exertions on these and similar occasions, and was finally promoted for his services in January, 1855. He received the distinction of C.B. and of officer of the Legion of Honour at the close of the war.

On peace being proclaimed, Captain Spratt resumed his hydrographical surveys in the Archipelago, and continued them until the close of 1863.

Amongst papers and works published by Captain Spratt may be mentioned—

'A Report on the Geology of Malta and Gozo,' 1854.

'On the Movements of Teignmouth Bar,' 1856.

'Deep Soundings in the Mediterranean,' 1856-7.

'On the Comparative Conditions on the Different Mouths Branches of the Danube,' 1858.

'Investigation of the Effect of the Prevailing Wave Influence on the Nile Deposits,' 1859.

'On the Evidences of Rapid Silting in progress at Port Said,' 1870.

'Travels and Researches in Crete,' in two volumes, 1865.

This last work eminently illustrates his powers and versatility in different branches of scientific observation, and contains much valuable information on geological, archæological, and other subjects.

Captain Spratt became a Rear-Admiral on the retired list in 1872, and a Vice-Admiral in 1878. He was a Fellow of the Geological, Zoological, and Geographical Societies, and of the Society of Antiquaries, and was elected a Fellow of the Royal Society in 1856.

He was a Commissioner of Fisheries from 1866 to 1873, and held the appointment of Acting Conservator of the Mersey from 1879 to his death, which occurred on the 18th March, 1888.

W. J. W.